

More Chapter 3 Study Questions

- Sodium sulfate has the formula Na_2SO_4 .
 - What is the mass percentage of each element in sodium sulfate?
 - How many grams of this compound contain 2.00 grams sulfur?
- A sample of tin (Sn) is heated in air to form a tin oxide. Assuming all of the tin is converted to the oxide, use the data table below to determine the empirical formula of the tin oxide formed.

mass of crucible	=	31.50 g
mass of crucible + tin (before heating)	=	33.40 g
mass of crucible + tin (after heating)	=	33.91 g
- A compound is made up of 30.4% N and 69.6% O.
 - Find the empirical formula of this compound.
 - The compound has a molar mass of 92.0 grams/mole. What is the molecular formula of this compound?
- Octane undergoes complete combustion to form carbon dioxide and water.
 - Balance the following chemical equation for the combustion of octane:
$$\text{C}_8\text{H}_{18}(l) + \text{O}_2(g) \rightarrow \text{CO}_2(g) + \text{H}_2\text{O}(l)$$
 - How many moles of oxygen are required to burn 1.00 mole of octane?
 - How many grams of octane are needed to produce 6.63 moles of water?
 - How many moles of CO_2 are produced from the combustion of 101 grams of octane?
 - What mass of CO_2 is produced when 4.77 grams of oxygen gas are used up?
 - How many molecules of water are produced by the combustion of 2.1 grams of octane?
 - What mass of CO_2 is produced starting from 5.00 g O_2 and 1.62 g C_8H_{18} ?
 - What is the percent yield if 3.70 g of CO_2 are produced starting from 1.62 g C_8H_{18} ?
- A compound is 45.0% lead (Pb) and 55.0% iodine (I) by mass. What is the empirical formula of the compound? What is the name of this compound?